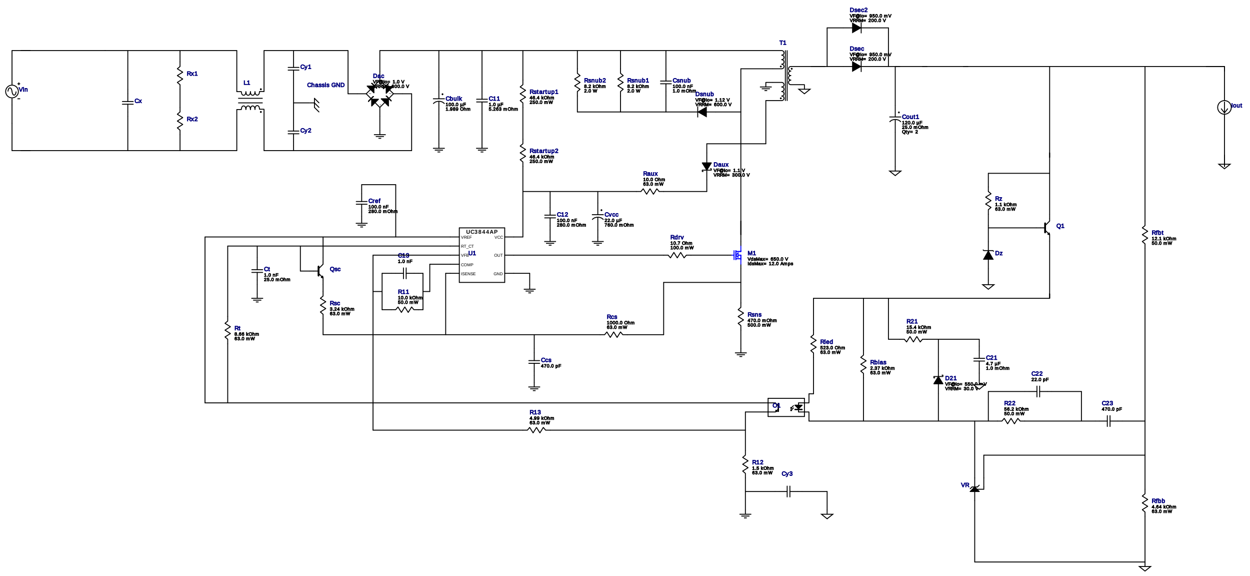
VinMin = 85.0V
VinMax = 265.0V
Vout = 9.0V
Iout = 3.0A

Device = UC3844AN
Topology = Flyback
Created = 2023-02-16 11:10:20.091
BOM Cost = $9.35
BOM Count = 48
Total Pd = 4.25W

WEBENCH ® Design Report

Design : 15 UC3844AN
UC3844AN 85V-265V to 9.00V @ 3A



1. The EMI filter shown in the schematic is a placeholder. It has not yet been designed for the application.

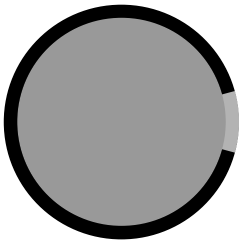
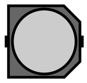
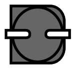
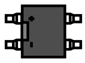
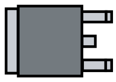
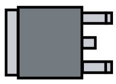
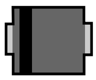
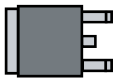
Design Alerts

Component Selection Information

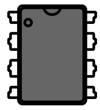
Click on the transformer symbol in the schematic and select "Explore Transformer Core/Bobbin Selection" to design using specific transformer cores and bobbin.

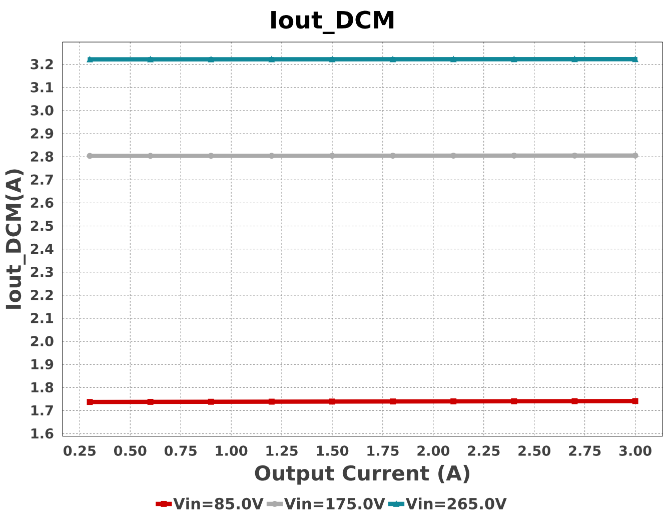
Electrical BOM

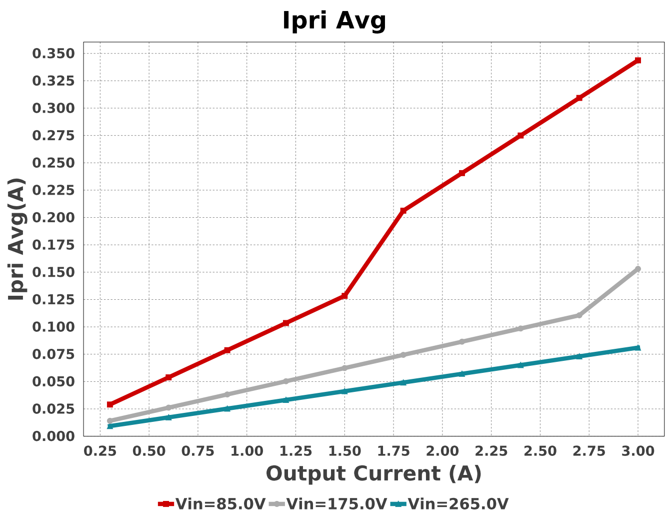
Name	Manufacturer	Part Number	Properties	Qty	Price	Footprint
C11	TDK	C5750X6S2W105K Series= X6S	Cap= 1.0 uF ESR= 5.263 mOhm VDC= 400.0 V IRMS= 0.0 A	1	$1.25	2220 54 mm^2
C12	AVX	08053C104KAT2A Series= X7R	Cap= 100.0 nF ESR= 280.0 mOhm VDC= 25.0 V IRMS= 0.0 A	1	$0.01	0805 7 mm^2
C13	MuRata	GRM1555C1H102JA01J Series= C0G/NP0	Cap= 1.0 nF VDC= 50.0 V IRMS= 0.0 A	1	$0.01	0402 3 mm^2
C21	Taiyo Yuden	EMK212BJ475KG-T Series= X5R	Cap= 4.7 uF ESR= 1.0 mOhm VDC= 16.0 V IRMS= 0.0 A	1	$0.06	0805 7 mm^2
C22	Samsung Electro-Mechanics	CL21C220JBANNNC Series= C0G/NP0	Cap= 22.0 pF VDC= 50.0 V IRMS= 0.0 A	1	$0.01	0805 7 mm^2
C23	Samsung Electro-Mechanics	CL21C471JBANNNC Series= C0G/NP0	Cap= 470.0 pF VDC= 50.0 V IRMS= 0.0 A	1	$0.01	0805 7 mm^2

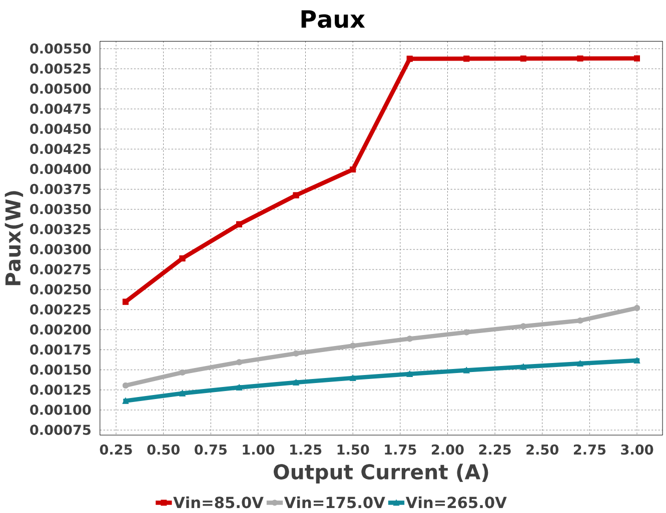
Name	Manufacturer	Part Number	Properties	Qty	Price	Footprint
Cbulk	Nichicon	LLS2G101MELZ Series= 2387	Cap= 100.0 uF ESR= 1.989 Ohm VDC= 400.0 V IRMS= 950.0 mA	1	$1.09	 Nichicon_2200x2500_Snap 576 mm^2
Ccs	Samsung Electro-Mechanics	CL21C471JBANNNC Series= C0G/NP0	Cap= 470.0 pF VDC= 50.0 V IRMS= 0.0 A	1	$0.01	0805 7 mm^2
Cout1	Panasonic	20SVPF120M Series= SVPF	Cap= 120.0 uF ESR= 25.0 mOhm VDC= 20.0 V IRMS= 3.2 A	2	$0.57	 CAPSMT_62_F61 74 mm^2
Cref	AVX	08053C104KAT2A Series= X7R	Cap= 100.0 nF ESR= 280.0 mOhm VDC= 25.0 V IRMS= 0.0 A	1	$0.01	0805 7 mm^2
Csnub	TDK	CGA5L4X7T2W104M160AA Series= X7T	Cap= 100.0 nF ESR= 1.0 mOhm VDC= 450.0 V IRMS= 0.0 A	1	$0.23	1206_180 11 mm^2
Ct	Kemet	C0805C102J5GACTU Series= C0G/NP0	Cap= 1.0 nF ESR= 25.0 mOhm VDC= 50.0 V IRMS= 1.71 A	1	$0.02	0805 7 mm^2
Cvcc	Nichicon	UUD1V220MCL1GS Series= uD	Cap= 22.0 uF ESR= 760.0 mOhm VDC= 35.0 V IRMS= 150.0 mA	1	$0.14	 SM_RADIAL_5MM 58 mm^2
D21	Panasonic	DB2S31600L	VF@Io= 550.0 mV VRRM= 30.0 V	1	$0.03	SOD-523 5 mm^2
Dac	Diodes Inc.	HD06-T	VF@Io= 1.0 V VRRM= 600.0 V	1	$0.15	 MiniDIP 62 mm^2
Daux	SMC Diode Solutions	ST1300ATR	VF@Io= 1.1 V VRRM= 300.0 V	1	$0.12	 SMA 37 mm^2
Dsec	SMC Diode Solutions	SBRD10200TR	VF@Io= 950.0 mV VRRM= 200.0 V	1	$0.18	 DPAK 102 mm^2
Dsec2	SMC Diode Solutions	SBRD10200TR	VF@Io= 950.0 mV VRRM= 200.0 V	1	$0.18	 DPAK 102 mm^2
Dsnub	Bourns	CD214C-F3600	VF@Io= 1.12 V VRRM= 600.0 V	1	$0.23	 SMC 83 mm^2
Dz	ON Semiconductor	MMBZ5233BLT1G	Zener	1	$0.03	 SOT-23 14 mm^2
M1	STMicroelectronics	STD16N65M5	VdsMax= 650.0 V IdsMax= 12.0 Amps	1	$1.91	 DPAK 102 mm^2

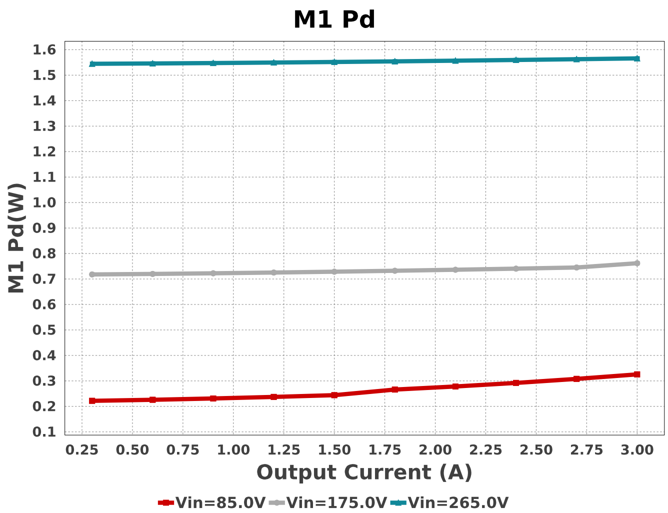
Name	Manufacturer	Part Number	Properties	Qty	Price	Footprint
O1	Vishay-Semiconductor	TCMT1107	Optocoupler	1	$0.19	SOP-4 44 mm^2
Q1	Diodes Inc.	MMBT3904-7-F	Bipolar Transistor	1	$0.02	SOT-23 14 mm^2
Qsc	STMicroelectronics	2N2222A	Bipolar Transistor	1	$1.19	TO-18 57 mm^2
R11	Yageo	RC0201FR-0710KL Series= ?	Res= 10.0 kOhm Power= 50.0 mW Tolerance= 1.0%	1	$0.01	0201 2 mm^2
R12	Vishay-Dale	CRCW04021K50FKED Series= CRCW..e3	Res= 1.5 kOhm Power= 63.0 mW Tolerance= 1.0%	1	$0.01	0402 3 mm^2
R13	Vishay-Dale	CRCW04024K99FKED Series= CRCW..e3	Res= 4.99 kOhm Power= 63.0 mW Tolerance= 1.0%	1	$0.01	0402 3 mm^2
R21	Yageo	RC0201FR-0715K4L Series= ?	Res= 15.4 kOhm Power= 50.0 mW Tolerance= 1.0%	1	$0.01	0201 2 mm^2
R22	Yageo	RC0201FR-0756K2L Series= ?	Res= 56.2 kOhm Power= 50.0 mW Tolerance= 1.0%	1	$0.01	0201 2 mm^2
Raux	Vishay-Dale	CRCW040210R0FKED Series= CRCW..e3	Res= 10.0 Ohm Power= 63.0 mW Tolerance= 1.0%	1	$0.01	0402 3 mm^2
Rbias	Vishay-Dale	CRCW04022K37FKED Series= CRCW..e3	Res= 2.37 kOhm Power= 63.0 mW Tolerance= 1.0%	1	$0.01	0402 3 mm^2
Rcs	Vishay-Dale	CRCW04021K00FKED Series= CRCW..e3	Res= 1000.0 Ohm Power= 63.0 mW Tolerance= 1.0%	1	$0.01	0402 3 mm^2
Rdrv	Vishay-Dale	CRCW060310R7FKEA Series= CRCW..e3	Res= 10.7 Ohm Power= 100.0 mW Tolerance= 1.0%	1	$0.01	0603 5 mm^2
Rfbb	Vishay-Dale	CRCW04024K64FKED Series= CRCW..e3	Res= 4.64 kOhm Power= 63.0 mW Tolerance= 1.0%	1	$0.01	0402 3 mm^2
Rfbt	Yageo	RC0201FR-0712K1L Series= ?	Res= 12.1 kOhm Power= 50.0 mW Tolerance= 1.0%	1	$0.01	0201 2 mm^2
Rled	Vishay-Dale	CRCW0402523RFKED Series= CRCW..e3	Res= 523.0 Ohm Power= 63.0 mW Tolerance= 1.0%	1	$0.01	0402 3 mm^2
Rsc	Vishay-Dale	CRCW04023K24FKED Series= CRCW..e3	Res= 3.24 kOhm Power= 63.0 mW Tolerance= 1.0%	1	$0.01	0402 3 mm^2
Rsns	Rohm	MCR25JZHFLR470 Series= MCR25	Res= 470.0 mOhm Power= 500.0 mW Tolerance= 1.0%	1	$0.03	1210 15 mm^2
Rsnub1	Vishay-Bccomponents	PR02000208201JR500 Series= ?	Res= 8.2 kOhm Power= 2.0 W Tolerance= 5.0%	1	$0.06	PR02 117 mm^2
Rsnub2	Vishay-Bccomponents	PR02000208201JR500 Series= ?	Res= 8.2 kOhm Power= 2.0 W Tolerance= 5.0%	1	$0.06	PR02 117 mm^2
Rstartup1	Yageo	RC1206FR-0746K4L Series= ?	Res= 46.4 kOhm Power= 250.0 mW Tolerance= 1.0%	1	$0.01	1206 11 mm^2

Name	Manufacturer	Part Number	Properties	Qty	Price	Footprint
Rstartup2	Yageo	RC1206FR-0746K4L Series= ?	Res= 46.4 kOhm Power= 250.0 mW Tolerance= 1.0%	1	$0.01	 1206 11 mm^2
Rt	Vishay-Dale	CRCW04028K66FKED Series= CRCW..e3	Res= 8.66 kOhm Power= 63.0 mW Tolerance= 1.0%	1	$0.01	0402 3 mm^2
Rz	Vishay-Dale	CRCW04021K10FKED Series= CRCW..e3	Res= 1.1 kOhm Power= 63.0 mW Tolerance= 1.0%	1	$0.01	0402 3 mm^2
T1	Core=TDK , CoilFormer=TDK	Core=B66317G0000X187 , CoilFormer=B66208X1110T001	Lp= 285.0 µH Turns Ratio(Nas)= 13:8 Turns Ratio(Nps)= 37:8 Npri= 37.0 Naux= 13.0 Nsec= 8.0	1	$0.30	 TDK_B66305 569 mm^2
U1	Texas Instruments	UC3844AN	Switcher	1	$0.43	 P0008A 116 mm^2
VR	Texas Instruments	TL431IDBVR	Voltage References	1	$0.09	 R-PDSO-G3 16 mm^2

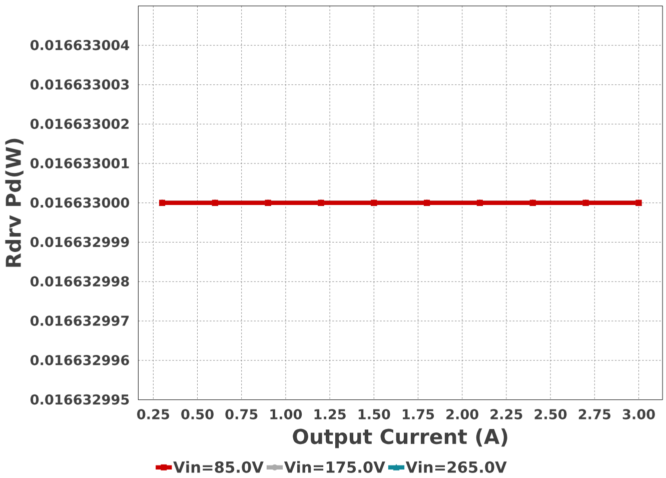




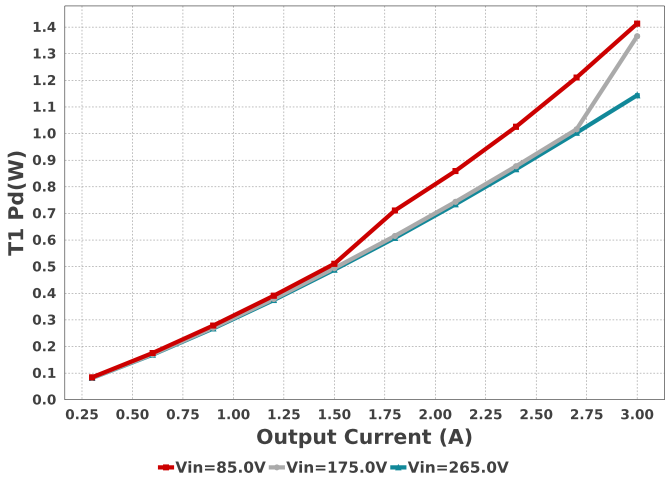




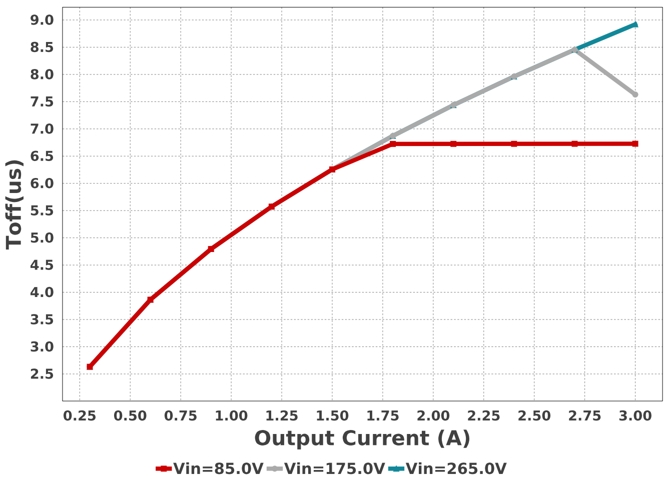
Rdrv Pd



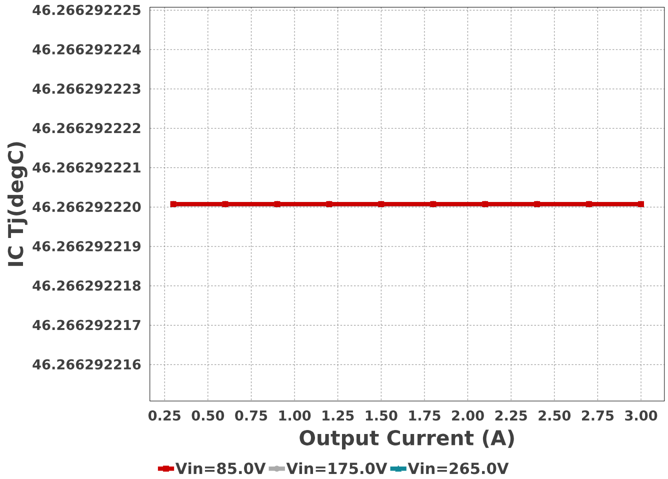
T1 Pd



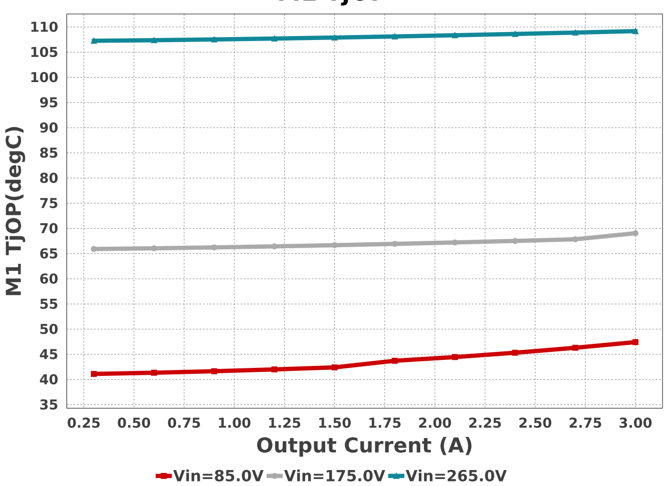
Toff



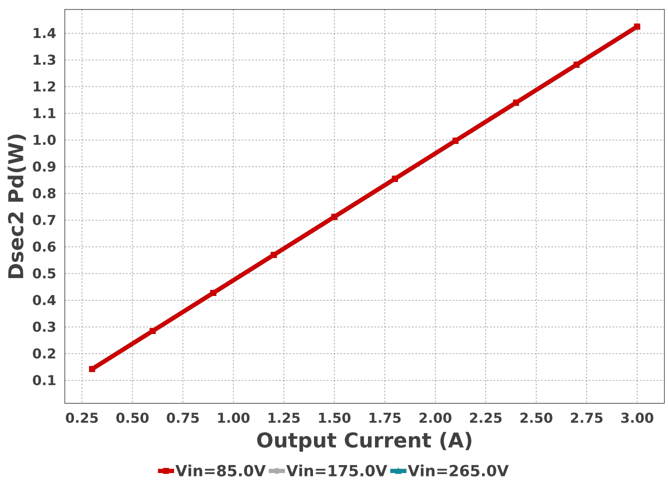
IC Tj

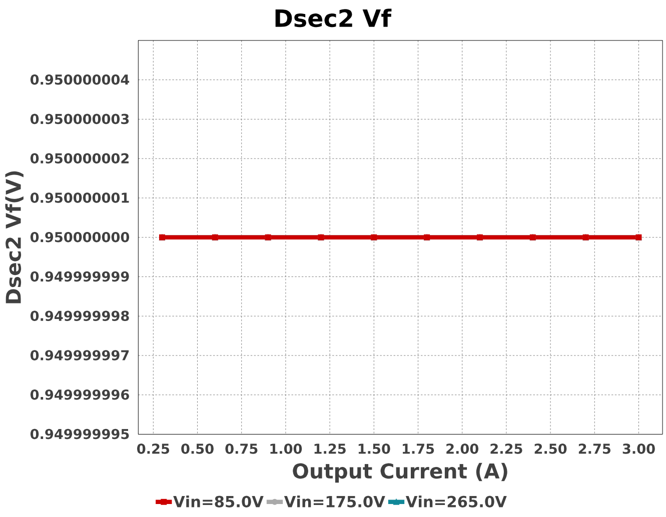


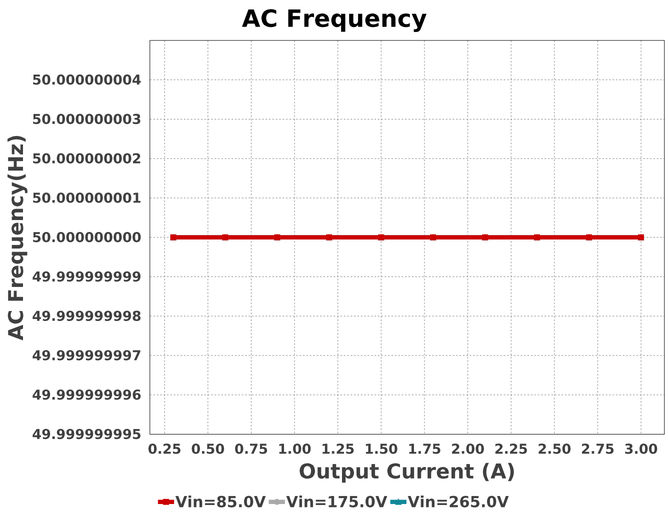
M1 TjOP

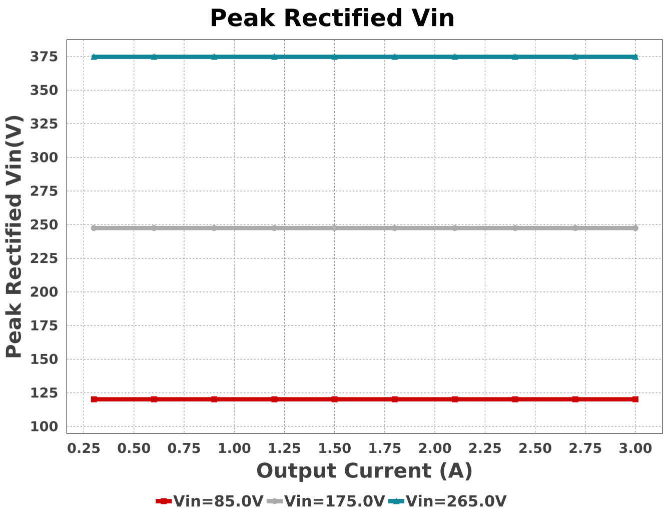


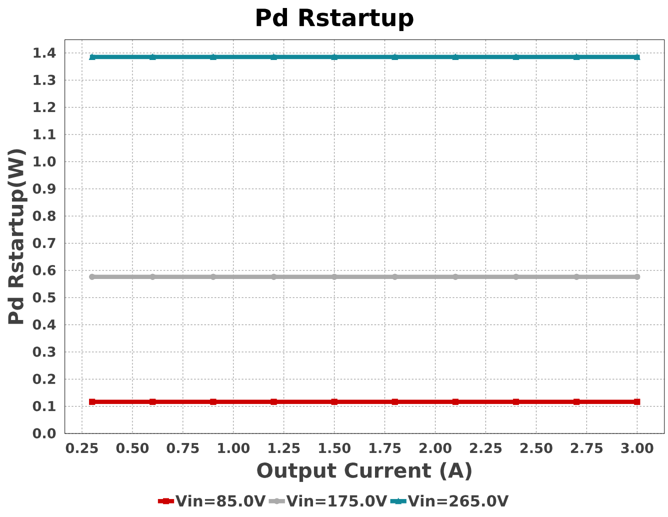
Dsec2 Pd

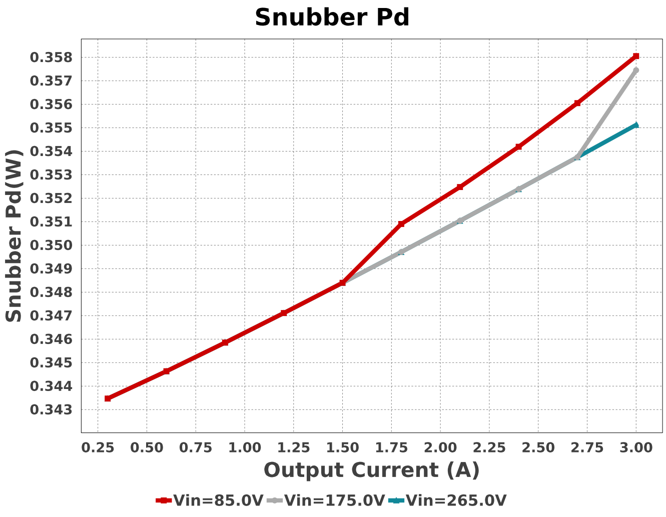


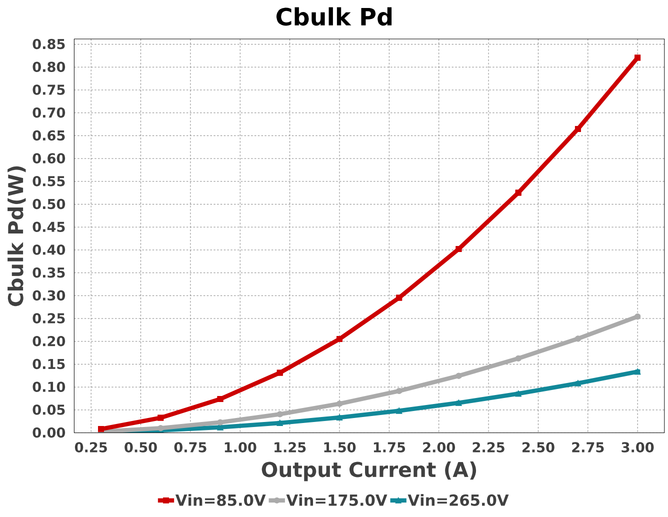

Dsec2 Vf
Dsec2 Vf(V)
0.950000004
0.950000003
0.950000002
0.950000001
0.950000000
0.949999999
0.949999998
0.949999997
0.949999996
0.949999995
0.25 0.50 0.75 1.00 1.25 1.50 1.75 2.00 2.25 2.50 2.75 3.00
Output Current (A)
Vin=85.0V Vin=175.0V Vin=265.0V

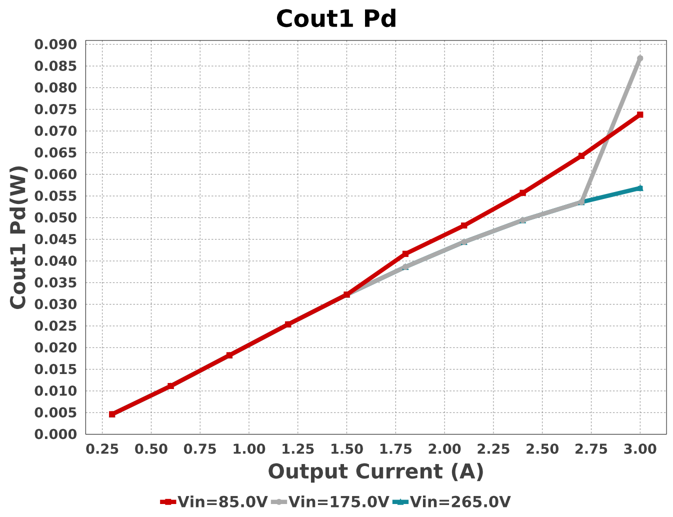

AC Frequency
AC Frequency(Hz)
50.000000004
50.000000003
50.000000002
50.000000001
50.000000000
49.999999999
49.999999998
49.999999997
49.999999996
49.999999995
0.25 0.50 0.75 1.00 1.25 1.50 1.75 2.00 2.25 2.50 2.75 3.00
Output Current (A)
Vin=85.0V Vin=175.0V Vin=265.0V

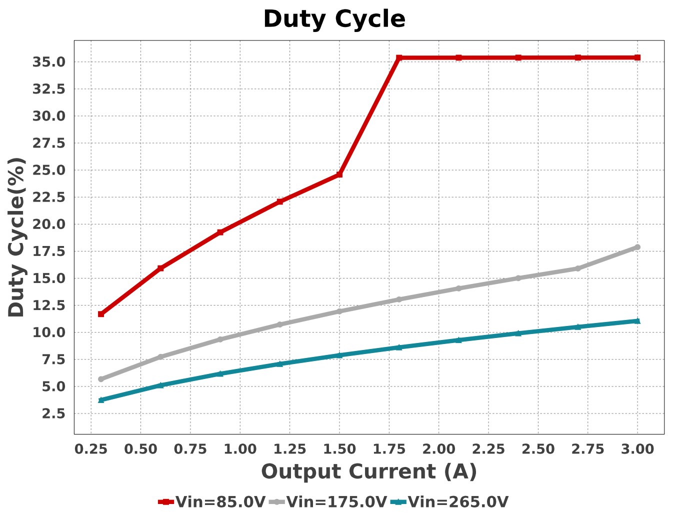

Peak Rectified Vin
Peak Rectified Vin(V)
375
350
325
300
275
250
225
200
175
150
125
100
0.25 0.50 0.75 1.00 1.25 1.50 1.75 2.00 2.25 2.50 2.75 3.00
Output Current (A)
Vin=85.0V Vin=175.0V Vin=265.0V

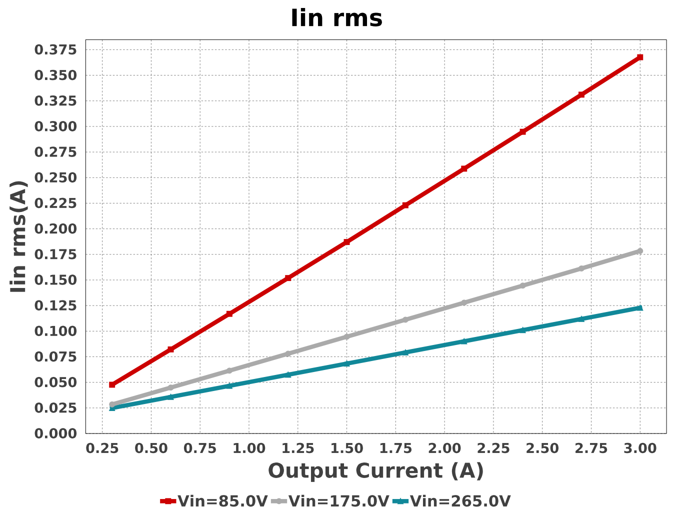

Pd Rstartup
Pd Rstartup(W)
1.4
1.3
1.2
1.1
1.0
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0.0
0.25 0.50 0.75 1.00 1.25 1.50 1.75 2.00 2.25 2.50 2.75 3.00
Output Current (A)
Vin=85.0V Vin=175.0V Vin=265.0V

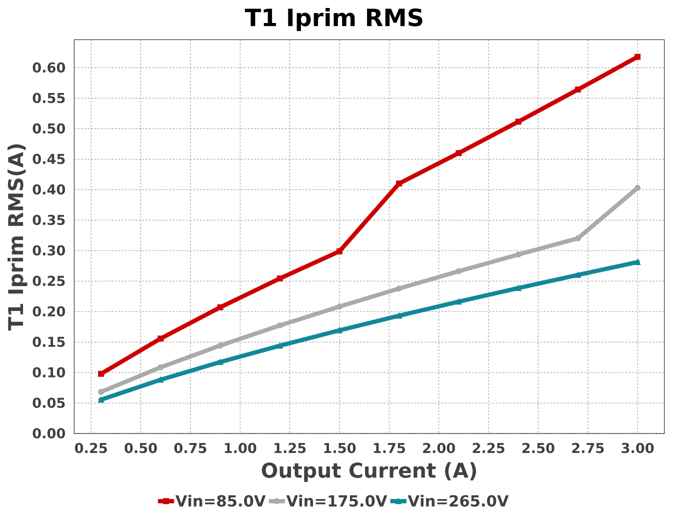

Snubber Pd
Snubber Pd(W)
0.358
0.357
0.356
0.355
0.354
0.353
0.352
0.351
0.350
0.349
0.348
0.347
0.346
0.345
0.344
0.343
0.25 0.50 0.75 1.00 1.25 1.50 1.75 2.00 2.25 2.50 2.75 3.00
Output Current (A)
Vin=85.0V Vin=175.0V Vin=265.0V

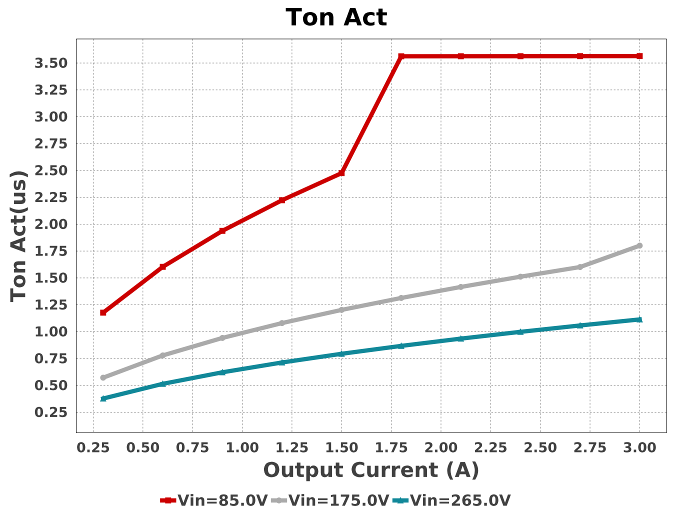

Cbulk Pd
Cbulk Pd(W)
0.85
0.80
0.75
0.70
0.65
0.60
0.55
0.50
0.45
0.40
0.35
0.30
0.25
0.20
0.15
0.10
0.05
0.00
0.25 0.50 0.75 1.00 1.25 1.50 1.75 2.00 2.25 2.50 2.75 3.00
Output Current (A)
Vin=85.0V Vin=175.0V Vin=265.0V

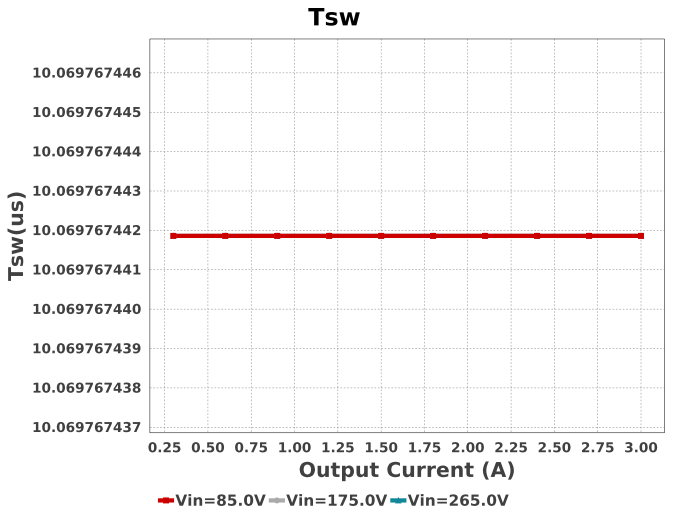

Cout1 Pd
Cout1 Pd(W)
Output Current (A)
Vin=85.0V
Vin=175.0V
Vin=265.0V


Duty Cycle
Duty Cycle(%)
Output Current (A)
Vin=85.0V
Vin=175.0V
Vin=265.0V

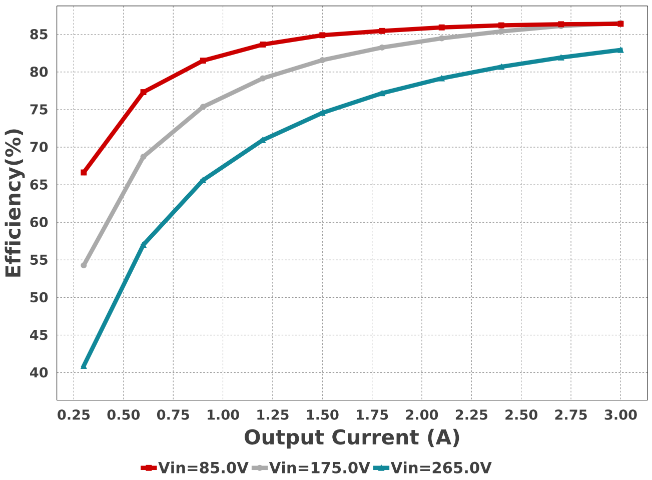

Iin rms
Iin rms(A)
Output Current (A)
Vin=85.0V
Vin=175.0V
Vin=265.0V


T1 Iprim RMS
T1 Iprim RMS(A)
Output Current (A)
Vin=85.0V
Vin=175.0V
Vin=265.0V

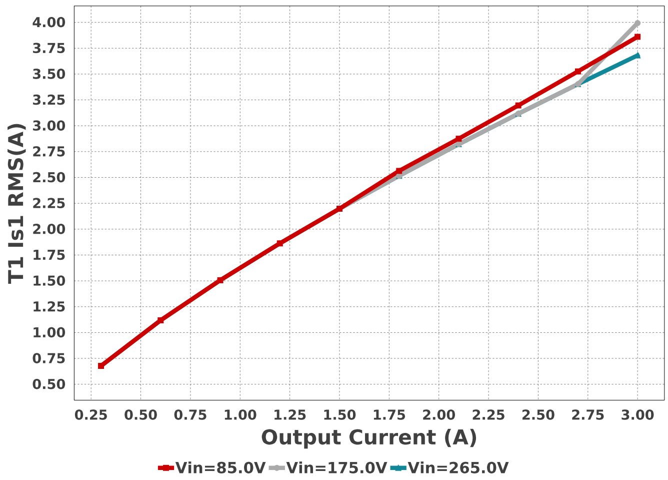

Ton Act
Ton Act(us)
Output Current (A)
Vin=85.0V
Vin=175.0V
Vin=265.0V


Tsw
Tsw(us)
Output Current (A)
Vin=85.0V
Vin=175.0V
Vin=265.0V

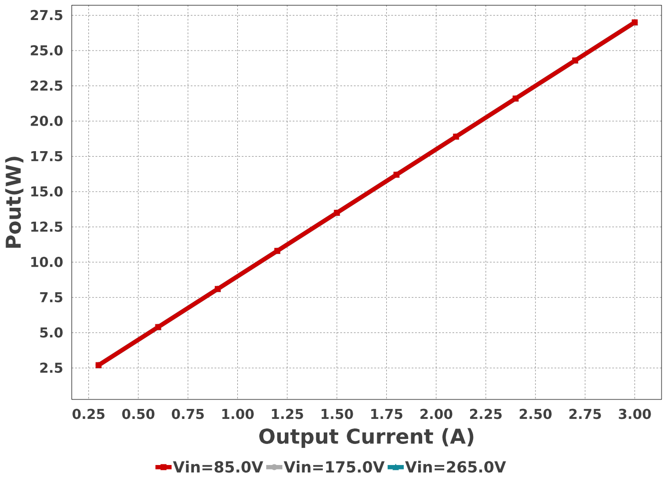
Efficiency



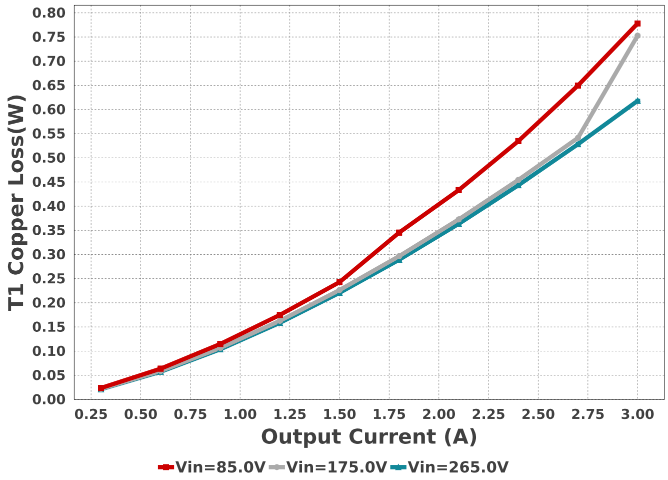
T1 Is1 RMS



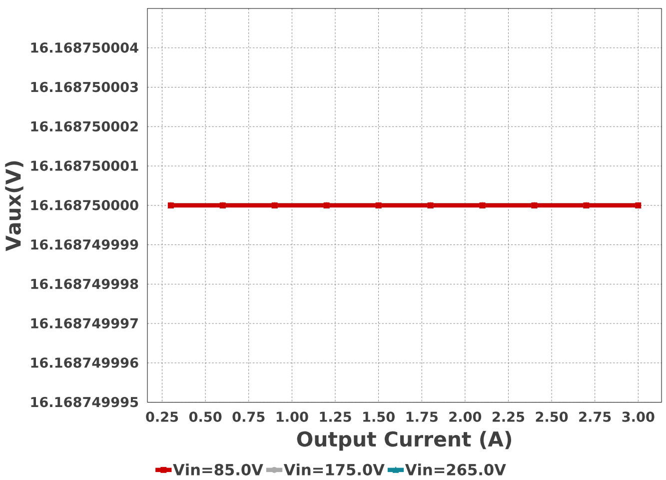
Pout



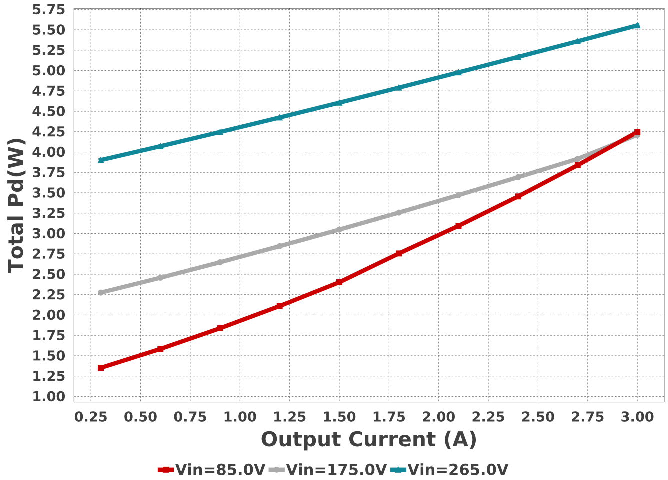
T1 Copper Loss



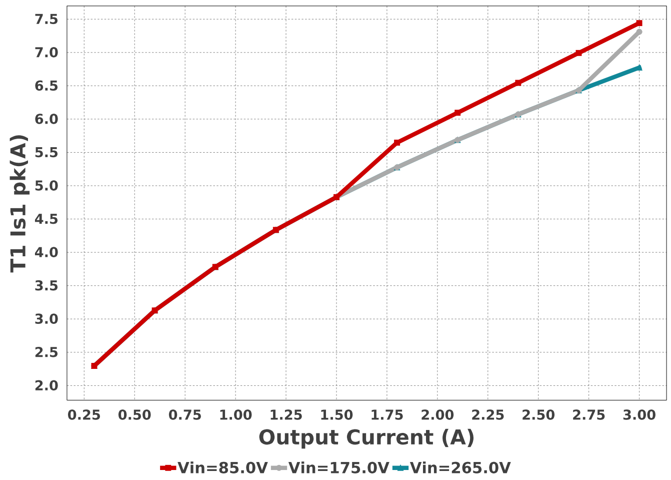
Vaux



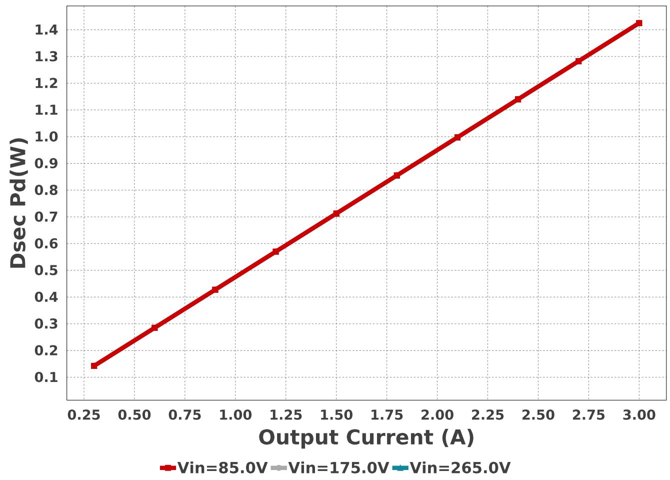
Total Pd



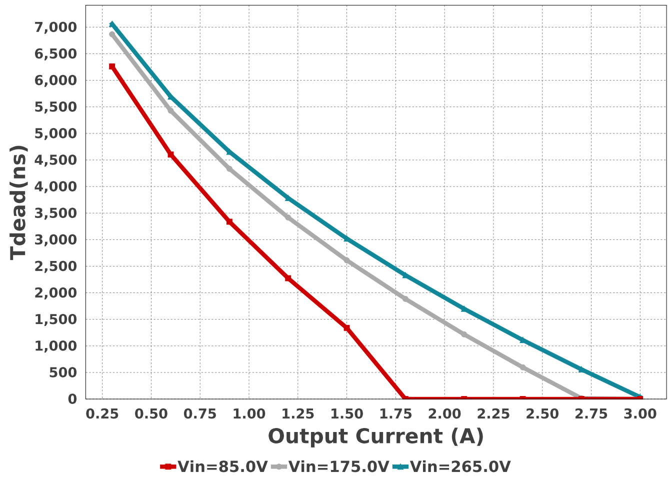
T1 Is1 pk



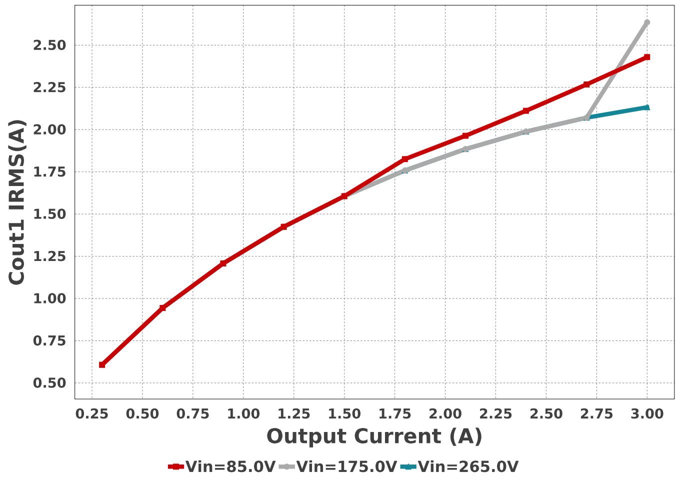
Dsec Pd



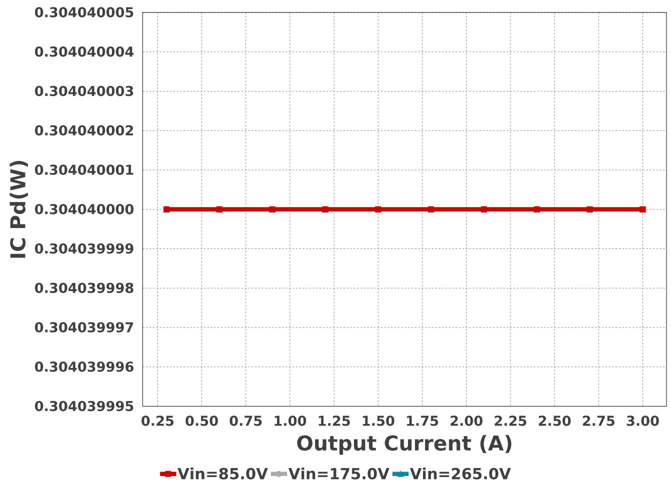
Tdead



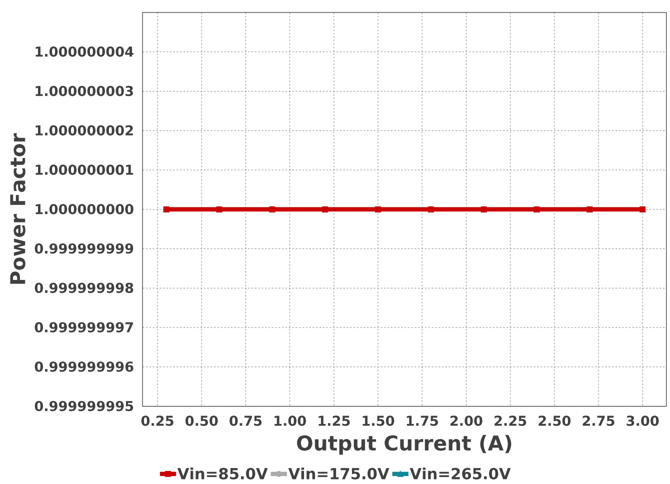
Cout1 IRMS

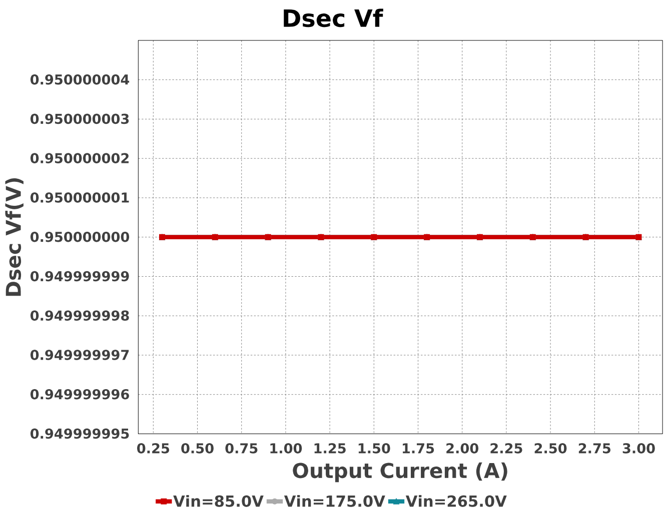


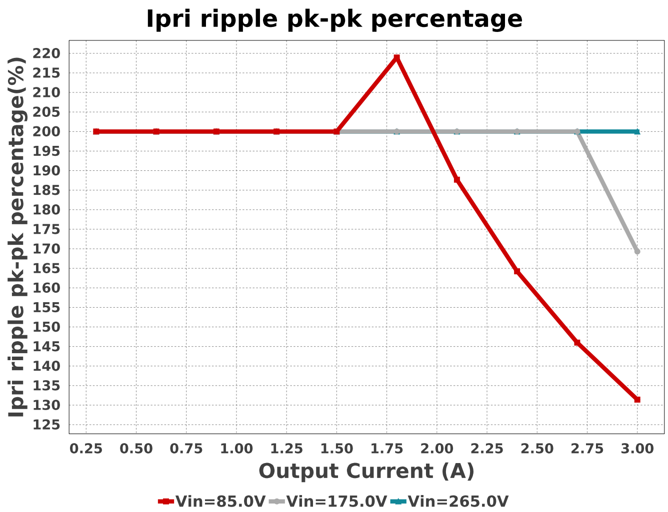
IC Pd

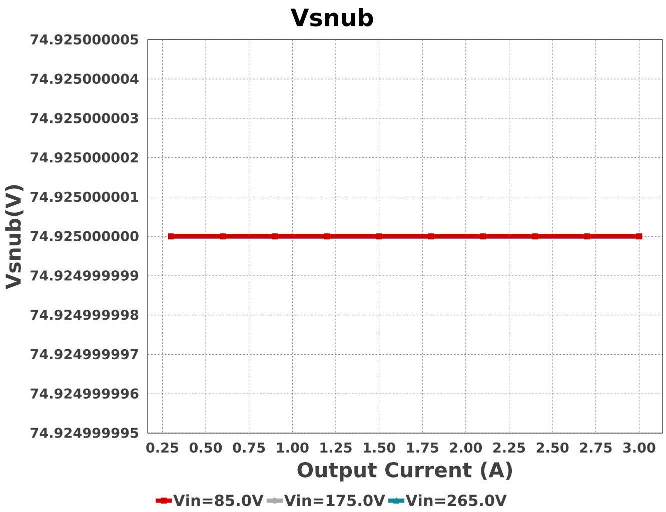


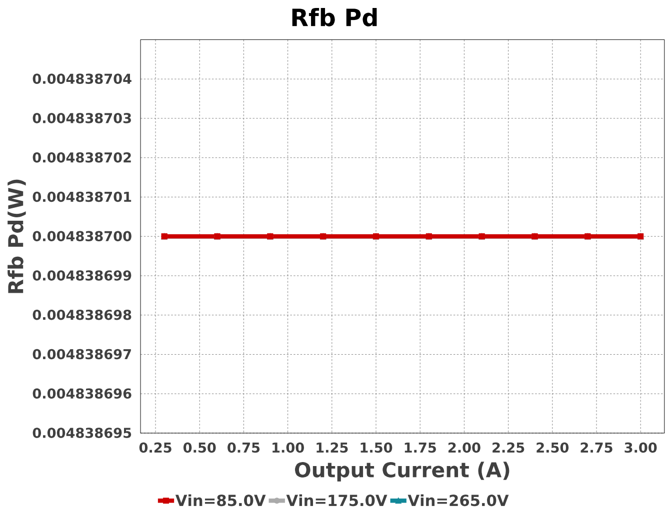
Power Factor

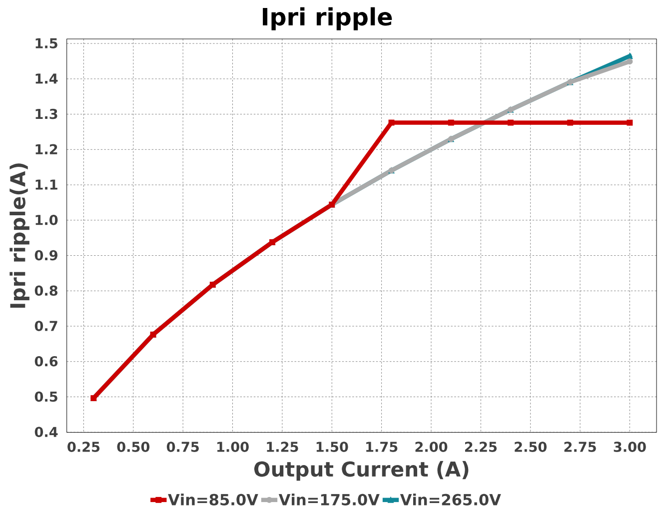


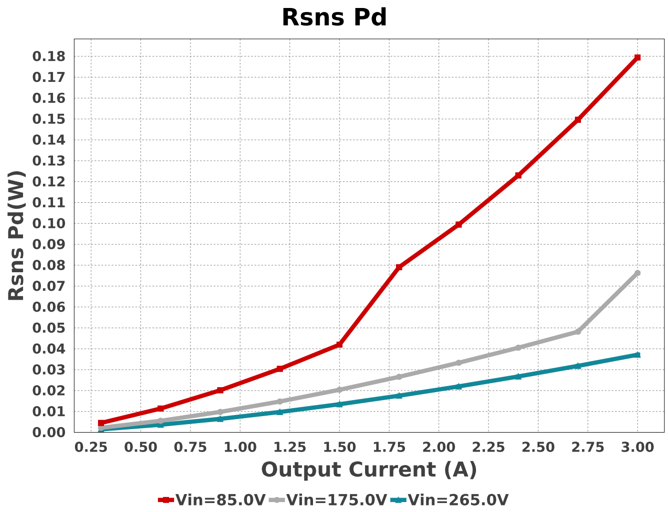

Dsec Vf
Dsec Vf(V)
Output Current (A)
Vin=85.0V Vin=175.0V Vin=265.0V

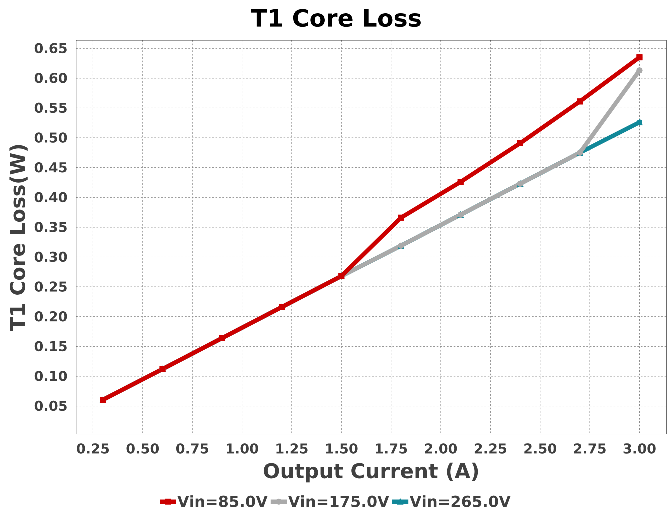

Ipri ripple pk-pk percentage
Ipri ripple pk-pk percentage(%)
Output Current (A)
Vin=85.0V Vin=175.0V Vin=265.0V

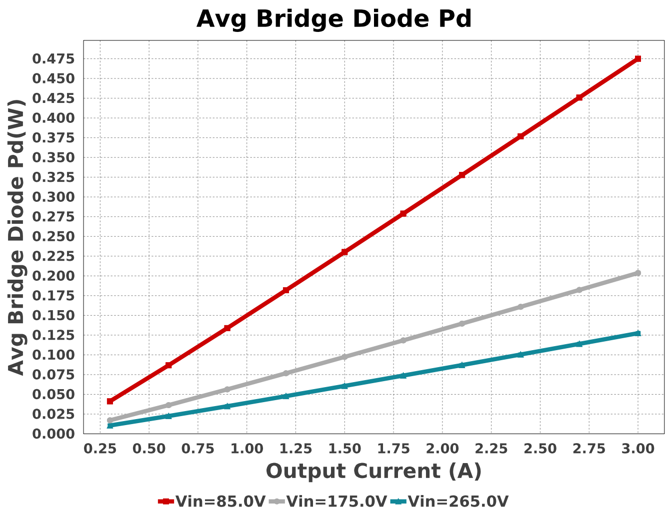

Vsnub
Vsnub(V)
Output Current (A)
Vin=85.0V Vin=175.0V Vin=265.0V

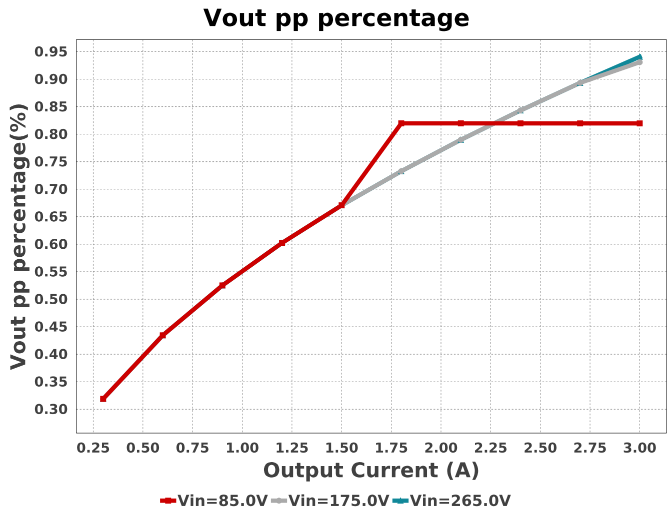

Rfb Pd
Rfb Pd(W)
Output Current (A)
Vin=85.0V Vin=175.0V Vin=265.0V

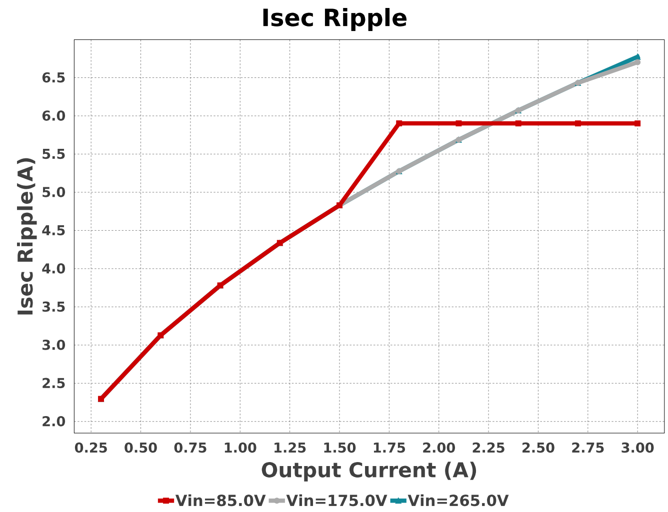

Ipri ripple
Ipri ripple(A)
Output Current (A)
Vin=85.0V Vin=175.0V Vin=265.0V

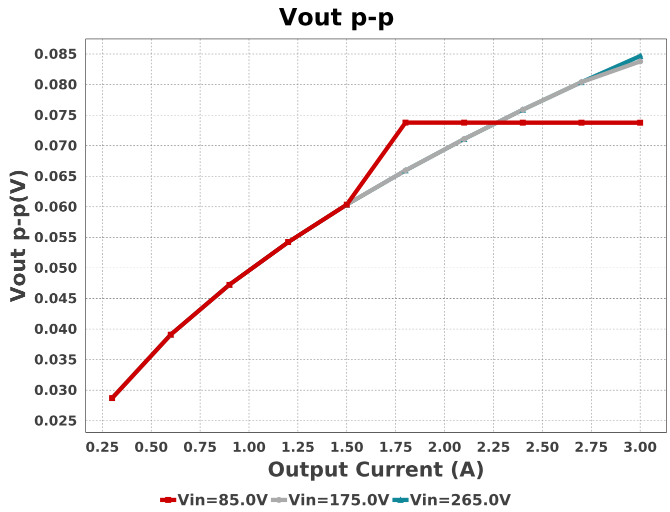

Rsns Pd
Rsns Pd(W)
Output Current (A)
Vin=85.0V Vin=175.0V Vin=265.0V

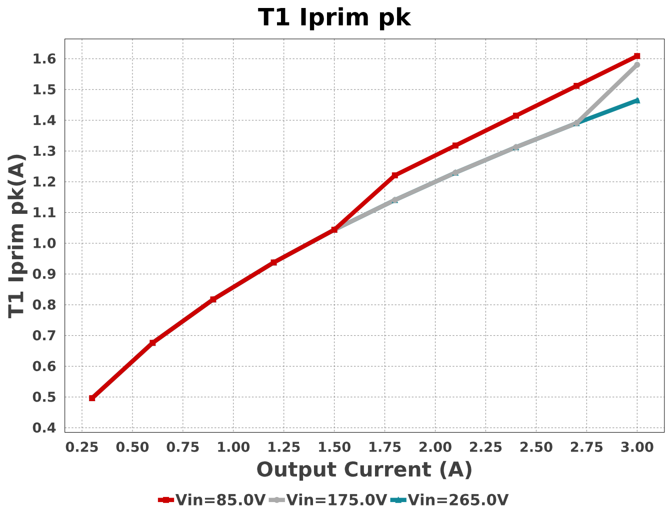












Operating Values

#	Name	Value	Category	Description
1.	BOM Count	48		Total Design BOM count
2.	Total BOM	$9.354		Total BOM Cost
3.	Cbulk Pd	820.62 mW	Capacitor	Bulk capacitor power dissipation
4.	Cout1 IRMS	2.429 A	Capacitor	Output capacitor1 RMS ripple current
5.	Cout1 Pd	73.773 mW	Capacitor	Output capacitor1 power dissipation
6.	Avg Bridge Diode Pd	475.0 mW	Diode	Average Power Dissipation in the Bridge Diode over the AC Line Period
7.	Dsec Pd	1.425 W	Diode	Secondary Diode Power Dissipation
8.	Dsec Vf	950.0 mV	Diode	Effective Forward Voltage Drop at the Operating Current
9.	Dsec2 Pd	1.425 W	Diode	Secondary Diode Power Dissipation
10.	Dsec2 Vf	950.0 mV	Diode	Effective Forward Voltage Drop at the Operating Current
11.	IC Pd	304.04 mW	IC	IC power dissipation

#	Name	Value	Category	Description
12.	IC Tj	46.266 degC	IC	IC junction temperature
13.	ICThetaJA	53.5 degC/W	IC	IC junction-to-ambient thermal resistance
14.	M1 Pd	325.65 mW	Mosfet	M1 MOSFET total power dissipation
15.	M1 TjOP	47.429 degC	Mosfet	M1 MOSFET junction temperature
16.	Avg Bridge Diode Pd	475.0 mW	Power	Average Power Dissipation in the Bridge Diode over the AC Line Period
17.	Cbulk Pd	820.62 mW	Power	Bulk capacitor power dissipation
18.	Cout1 Pd	73.773 mW	Power	Output capacitor1 power dissipation
19.	Dsec Pd	1.425 W	Power	Secondary Diode Power Dissipation
20.	Dsec2 Pd	1.425 W	Power	Secondary Diode Power Dissipation
21.	IC Pd	304.04 mW	Power	IC power dissipation
22.	M1 Pd	325.65 mW	Power	M1 MOSFET total power dissipation
23.	Paux	5.38 mW	Power	Power Dissipation in Raux and Daux
24.	Pd Rstartup	116.54 mW	Power	Power Dissipation in Rstartup1 and Rstartup2
25.	Rdrv Pd	16.633 mW	Power	Power Dissipation in Gate Drive Resistor
26.	Rfb Pd	4.839 mW	Power	Rfb Power Dissipation
27.	Rsns Pd	179.41 mW	Power	Current Limit Sense Resistor Power Dissipation
28.	Snubber Pd	358.052 mW	Power	Snubber Power Dissipation
29.	T1 Copper Loss	777.98 mW	Power	Transformer Copper Loss Power Dissipation
30.	T1 Core Loss	635.0 mW	Power	Transformer Core Loss Power Dissipation
31.	T1 Pd	1.413 W	Power	Estimated Losses in Transformer
32.	Total Pd	4.246 W	Power	Total Power Dissipation
33.	Pd Rstartup	116.54 mW	Resistor	Power Dissipation in Rstartup1 and Rstartup2
34.	Rdrv Pd	16.633 mW	Resistor	Power Dissipation in Gate Drive Resistor
35.	Rfb Pd	4.839 mW	Resistor	Rfb Power Dissipation
36.	Rsns Pd	179.41 mW	Resistor	Current Limit Sense Resistor Power Dissipation
37.	AC Frequency	50.0 Hz	System Information	Input AC frequency
38.	Duty Cycle	35.398 %	System Information	Duty cycle
39.	Efficiency	86.411 %	System Information	Steady state efficiency
40.	FootPrint	2.534 k mm^2	System Information	Total Foot Print Area of BOM components
41.	Frequency	99.307 kHz	System Information	Switching frequency
42.	Iin rms	367.6 mA	System Information	RMS Input Current
43.	Iout	3.0 A	System Information	Iout operating point
44.	Iout_DCM	1.742 A	System Information	Approximate Current below which DCM mode of operation will begin
45.	Mode	CCM	System Information	Conduction Mode
46.	Peak Rectified Vin	120.207 V	System Information	Peak voltage seen at rectified input
47.	Pout	27.0 W	System Information	Total output power
48.	Power Factor	1.0	System Information	Assumed Power Factor for the Application
49.	Tdead	0.0 ns	System Information	Approximate Dead Time of the Regulator
50.	Toff	6.727 us	System Information	Approximate Converter Off Time
51.	Ton Act	3.565 us	System Information	Approximate Converter On Time
52.	Tsw	10.07 us	System Information	Switching Time Period
53.	Vin_RMS	85.0 V	System Information	Vin operating point
54.	Vout	9.0 V	System Information	Operational Output Voltage
55.	Vout Actual	9.001 V	System Information	Vout Actual calculated based on selected voltage divider resistors
56.	Vout Tolerance	1.786 %	System Information	Vout Tolerance based on IC Tolerance (no load) and voltage divider resistors if applicable
57.	Vout p-p	73.764 mV	System Information	Peak-to-peak output ripple voltage
58.	Vout pp percentage	819.596 m%	System Information	Output Voltage ripple percentage
59.	Vsnub	74.925 V	System Information	Voltage Across the Snubber
60.	Ipri Avg	343.698 mA	Transformer	Average Current in Primary Winding over the complete Switching Period
61.	Ipri ripple	1.276 A	Transformer	Ripple Current in the Primary Winding
62.	Ipri ripple pk-pk percentage	131.41 %	Transformer	Primary Current pk-pk ripple percentage(of Ipri avg during ton only)

#	Name	Value	Category	Description
63.	Isec Ripple	5.901 A	Transformer	Ripple Current in the Secondary Winding
64.	Paux	5.38 mW	Transformer	Power Dissipation in Raux and Daux
65.	T1 Copper Loss	777.98 mW	Transformer	Transformer Copper Loss Power Dissipation
66.	T1 Core Loss	635.0 mW	Transformer	Transformer Core Loss Power Dissipation
67.	T1 Iprim RMS	617.845 mA	Transformer	Transformer Primary RMS Current
68.	T1 Iprim pk	1.609 A	Transformer	Transformer Primary Peak Current
69.	T1 Is1 RMS	3.86 A	Transformer	Transformer Secondary1 RMS Current
70.	T1 Is1 pk	7.441 A	Transformer	Transformer Secondary1 Peak Current
71.	T1 Pd	1.413 W	Transformer	Estimated Losses in Transformer
72.	Vaux	16.169 V	Transformer	Auxiliary Voltage

Design Inputs

Name	Value	Description
Iout	3.0	Maximum Output Current
VinMax	265.0	Maximum input voltage
VinMin	85.0	Minimum input voltage
Vout	9.0	Output Voltage
acFrequency	50.0	AC Frequency
base_pn	UC3844A	Base Product Number
source	AC	Input Source Type
Ta	30.0	Ambient temperature

WEBENCH® Assembly

Component Testing

Some published data on components in datasheets such as Capacitor ESR and Inductor DC resistance is based on conservative values that will guarantee that the components always exceed the specification. For design purposes it is usually better to work with typical values. Since this data is not always available it is a good practice to measure the Capacitance and ESR values of Cin and Cout, and the inductance and DC resistance of L1 before assembly of the board. Any large discrepancies in values should be electrically simulated in WEBENCH to check for instabilities and thermally simulated in WebTHERM to make sure critical temperatures are not exceeded.

Soldering Component to Board

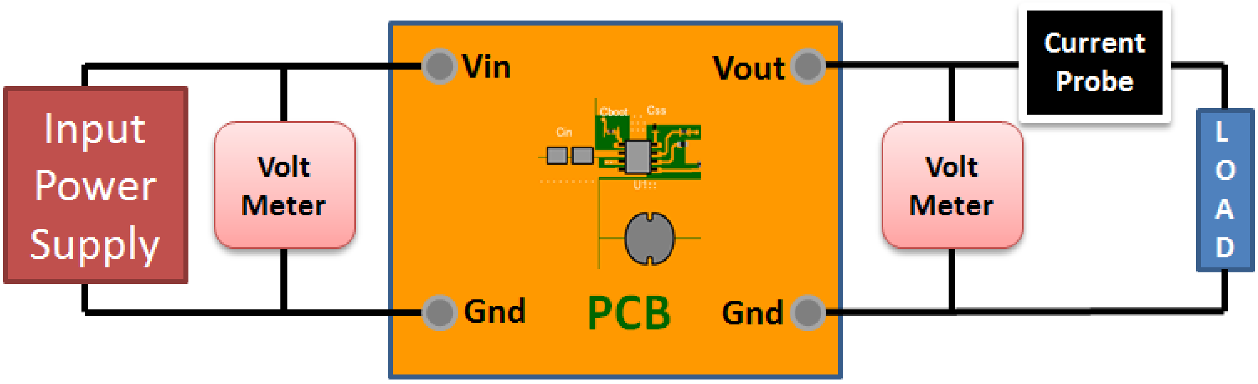
If board assembly is done in house it is best to tack down one terminal of a component on the board then solder the other terminal. For surface mount parts with large tabs, such as the DPAK, the tab on the back of the package should be pre-tinned with solder, then tacked into place by one of the pins. To solder the tab town to the board place the iron down on the board while resting against the tab, heating both surfaces simultaneously. Apply light pressure to the top of the plastic case until the solder flows around the part and the part is flush with the PCB. If the solder is not flowing around the board you may need a higher wattage iron (generally 25W to 30W is enough).

Initial Startup of Circuit

It is best to initially power up the board by setting the input supply voltage to the lowest operating input voltage 85.0V and set the input supply's current limit to zero. With the input supply off connect up the input supply to Vin and GND. Connect a digital volt meter and a load if needed to set the minimum Iout of the design from Vout and GND. Turn on the input supply and slowly turn up the current limit on the input supply. If the voltage starts to rise on the input supply continue increasing the input supply current limit while watching the output voltage. If the current increases on the input supply, but the voltage remains near zero, then there may be a short or a component misplaced on the board. Power down the board and visually inspect for solder bridges and recheck the diode and capacitor polarities. Once the power supply circuit is operational then more extensive testing may include full load testing, transient load and line tests to compare with simulation results.

Load Testing

The setup is the same as the initial startup, except that an additional digital voltmeter is connected between Vin and GND, a load is connected between Vout and GND and a current meter is connected in series between Vout and the load. The load must be able to handle at least rated output power + 50% (7.5 watts for this design). Ideally the load is supplied in the form of a variable load test unit. It can also be done in the form of suitably large power resistors. When using an oscilloscope to measure waveforms on the prototype board, the ground leads of the oscilloscope probes should be as short as possible and the area of the loop formed by the ground lead should be kept to a minimum. This will help reduce ground lead inductance and eliminate EMI noise that is not actually present in the circuit.



WEBENCH® Transformer Report

#	Name	Value
1.	Core Part Number	B66317G0000X187
2.	Core Manufacturer	TDK
3.	Coil Former Part Number	B66208X1110T001
4.	Coil Former Manufacturer	TDK

Transformer Electrical Diagram

Primary

Turns	37.0
AWG	28.0
Layers	2.0
Strands	2.0
Insulation Type	Heavy Insulated Magnet Wire

Secondary

Turns	8.0
AWG	30.0
Layers	1.0
Strands	3.0
Insulation Type	Triple Insulated

Auxiliary

Turns	13.0
AWG	28.0
Layers	1.0
Strands	3.0
Insulation Type	Heavy Insulated Magnet Wire

Transformer Construction Diagram

Winding Instruction

Winding	AWG	Turns	Winding Orientation
Primary First 1/2.0	28.0	19	Clockwise
Auxiliary	28.0	13.0	Counter Clockwise
Triple Insulated Secondary	30.0	8.0	Counter Clockwise
Primary Second 1/2.0	28.0	18	Clockwise

Transformer Parameters

#	Name	Value
1.	Lpri	2.85E-4H
2.	Inductance Factor(Al)	208.0nH
3.	Npri	37.0
4.	Nsec	8.0
5.	Naux	13.0
6.	Core Type	E25/13/7
7.	Core Material	N87

#	Name	Value
8.	Bmax	0.22T
9.	Switching Frequency	99.31kHz
10.	DMax	0.36
11.	Ipk(Primary)	1.51A
12.	Irms(Primary)	0.56A
13.	Ipk(Secondary)	7.0A
14.	Irms(Secondary)	3.48A

Design Assistance

1. Master key : 5601E6D956368EA766F626A92E56EDD0[v1]
2. **UC3844A** Product Folder : http://www.ti.com/product/UC3844A : contains the data sheet and other resources.